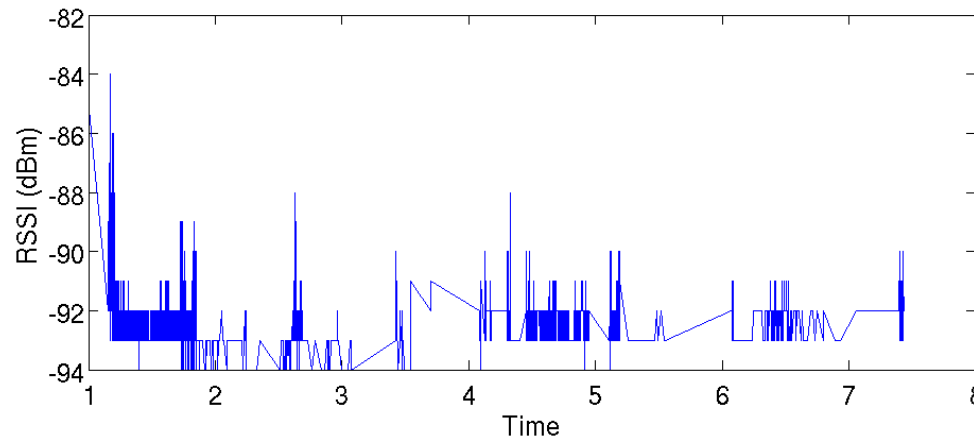


Auditing the use of CPM for Long Term Reception Power Modeling in TOSSIM

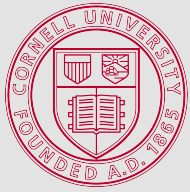


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- Currently the TOSSIM simulator models noise using Concurrent Pattern Matching but assumes that reception power is constant.
- This is in conflict with experimental evidence. Example RSSI variation plot:



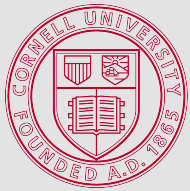
- We propose to model power by using experimentally collected traces and the CPM algorithm introduced by Lee, Cerpa, and Levis in 2007.



Determining Reception Power from Experiment is Complex



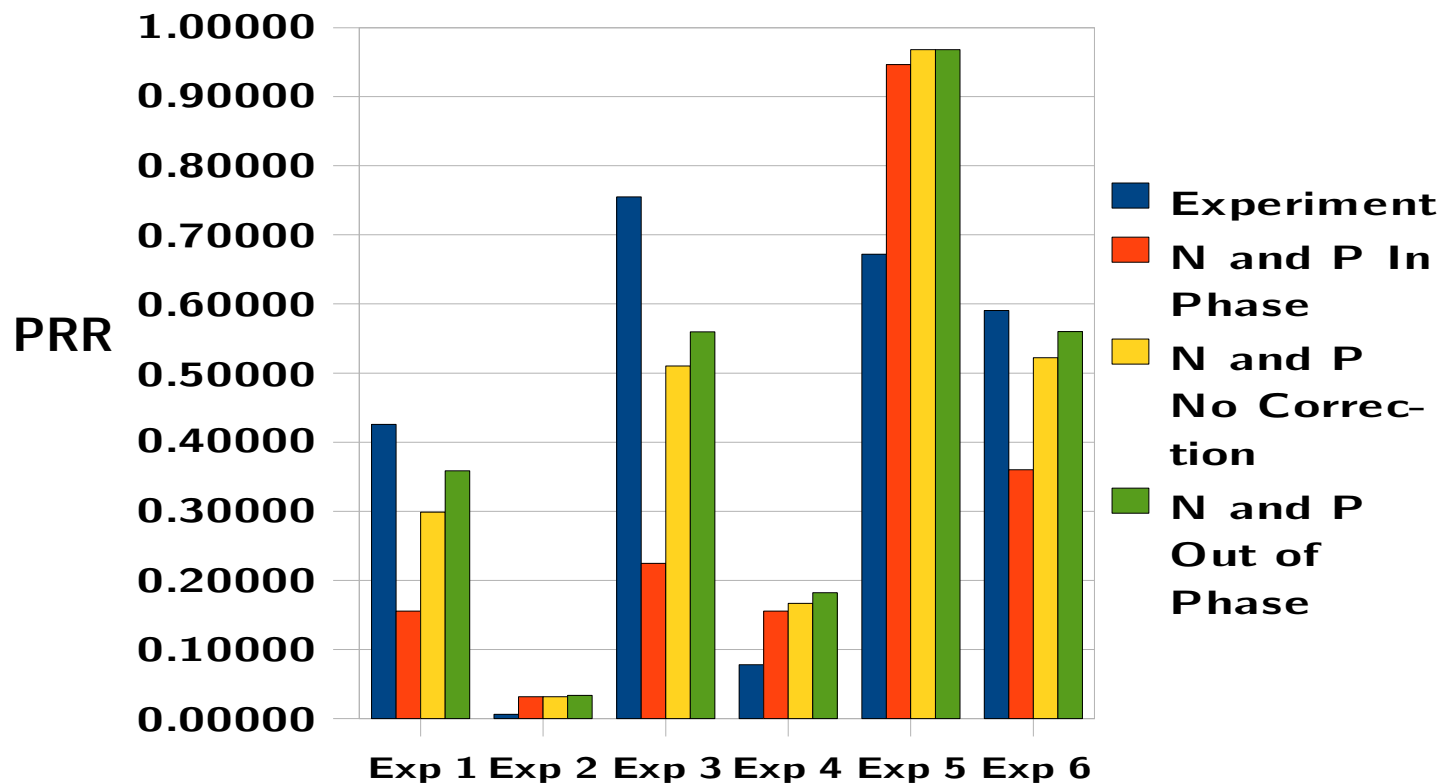
- Collecting power traces is more complex than collecting noise traces, since:
 - (1) power can only be approximated by sampling the RSSI register upon the reception of a packet;
 - (2) if a packet is lost, then even the RSSI estimate is not possible. Experiments collected were very sensitive and minor changes in mote position yielded very different PRRs.
- $|\text{Power}| = |\text{RSSI} - \text{Noise}|$. However, noise and power may be out of phase, so it is difficult to determine the numerical value for power.
- Filling in missing reception power values is a nontrivial problem.
- This work proposes an algorithm that provides preliminary answers to these questions.



Preliminary Results as of 2/22/2008



- Different algorithms are better modeled by different assumptions in the answers to these questions. For example:



- Code for simulator to be available on tinycos-2.x-contrib/cornell/ soon. **Please see my poster for more details.**